DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

TB Notes
No. 1, 1998

Dear Colleague:

By now, you should have all read the U.S. tuberculosis statistics for 1997, as described in the article by Dr. Marisa Moore entitled “Tuberculosis morbidity - United States, 1997" in the *Morbidity and Mortality Weekly Report* of April 10, 1998. The number of new cases for last year was 19,855, a 7% decrease from the 21,337 cases in 1996. The overall decline indicates that the United States has recovered from the resurgence of TB that occurred in the 1980s and that we continue to reap the benefits of our concentrated TB control efforts. However, the decreasing numbers mask a number of troubling trends. For example, the proportion of TB cases occurring in foreign-born persons continues to increase. In 1997, 39% of all U.S. TB cases were in persons who were born outside the United States. Also, while the rate of multidrug-resistant TB (MDRTB) remained stable, this phenomenon continues to be a serious threat, with 43 states and the District of Columbia now reporting MDRTB cases. Clearly, every state must be vigilant and prepared to deal with the challenges of these hard-to-treat strains. And HIV-infected persons continue to be at very high risk for developing TB disease. I’m sure you agree that we must commit to the challenge of TB elimination, or we risk allowing our communities to continue to face the danger of TB.

March 24 was World TB Day. This date is remembered as the anniversary of Dr. Robert Koch’s announcement that he had discovered the bacillus that causes TB. We encouraged state and local TB control programs to develop their own press conferences for the dissemination of local statistics and trends, and a number of states did so. In addition, the World Health Organization (WHO) held a news conference on March 19 in London. At the news conference, the WHO reported that worldwide progress toward TB elimination is stalled in a number of key countries. If TB is not controlled in these countries, it will infect 1 billion more people and kill 70 million more in the next two decades. Although DTBE did not hold a press conference this year in connection with the commemorative date, we did release a press advisory. We stated that in this era of increased mobility, no region of the world is isolated. International collaboration is essential to reverse the global spread of TB and to combat drug resistance. Our biggest challenge is improving TB treatment—incomplete or inconsistent treatment causes drug resistance; using directly observed therapy (DOT) prevents it. DOT has proven to be an essential part of TB control wherever it is applied, and we must expand and promote its use.

The TB Controllers Workshop was held in Atlanta January 29-31. This year’s theme was “Back on Track Toward Elimination of Tuberculosis.” We heard presentations and updates on U.S. TB surveillance trends, screening and preventive therapy, new research and diagnostic issues, training issues, managed care issues, strategies for controlling TB in foreign-born persons, new rapid diagnostic testing for TB, the Model TB Centers, and more effective TB prevention in the future. Dr. Bill Stead, the Director

of the Arkansas TB Control Program, was presented with the first “Excellence in TB Control Award” by Dr. Bruce Davidson on behalf of the National TB Controllers Association. Dr. Stead was given the award in recognition of his years of dedicated service in the field of TB control and elimination. The fact that he received a standing ovation from the large crowd in the closing plenary session is not only a tribute to his distinguished career; it is also a reflection of the high regard in which he is held by his peers and colleagues. Well deserved, Bill!

The 3rd annual meeting of the International Union Against Tuberculosis and Lung Disease (IUATLD), North American Region, was held February 26-28, 1998, in Vancouver, British Columbia, Canada. The meeting, entitled “Tuberculosis Among the Disadvantaged,” began with a lively nursing symposium that included a poster viewing and four selected presentations on topics of interest to nurses and allied health care professionals. Dr. Donald Henderson officially opened the meeting with a keynote speech,"The Challenge of Eradication: Lessons from Other Eradication Programs." Presentations on February 27 covered a variety of issues related to TB control in hard-to-reach populations, including such topics as the impact of poverty on TB, the use of case management in inner city programs, aboriginal health, and others. The evening was capped with a poster symposium and reception. Sessions on the 28th focused on scientific advances, the risk factors for nosocomial transmission, and the use of BCG and INH in preventing and reducing TB transmission. Over 100 physicians, nurses, and allied health professionals were in attendance from the United States, Canada, and the Caribbean.

A conference on Global Disease Elimination and Eradication as Public Health Strategies was held in Atlanta on February 23-25. Discussions about the feasibility of eliminating bacterial infections prominently featured talks about efforts to eliminate TB. Interestingly, the Dahlem Workshop Report on *The Eradication of Infectious Diseases* defined disease elimination as no cases in a geographic area, and may require a revision of our previous definition. Also, the First Emerging Infectious Diseases Conference was held in Atlanta March 8-11. Plenary sessions featured Dr. Gail Woods, who presented advances in the development of new diagnostic tools for TB; Dr. Chris Murray, who presented TB projections; and Dr. Barry Bloom, who discussed advances in TB vaccine development. Finally, Dr. Denise Garrett presented data on the risk of nosocomial TB in developing countries.

The Advisory Council for the Elimination of Tuberculosis (ACET) met in Atlanta on April 14 and 15. At the meeting, I provided information on continuing activities in the division, and gave an update on the global TB situation. We also heard brief updates on TB surveillance and epidemiologic investigations, on the development of new TB treatment and preventive therapy recommendations, on the results of evaluating the two commercial PPD products, and on the funding of TB cooperative agreements. There followed a discussion regarding TB vaccines. Carl Schieffelbein and I then reviewed the progress that has been made in the past with TB control, and discussed

what will be needed in the future to move forward with TB elimination. We also heard presentations about TB recommendations for HIV-infected persons as well as about the strategic planning process underway to address TB training issues.

The 1998 American Lung Association (ALA)/American Thoracic Society (ATS) International Conference was held April 24-29 in Chicago. There were many excellent presentations on TB. Drs. William Bailey and Lee Reichman chaired a symposium at which researchers presented findings comparing different approaches to promote effective TB screening, treatment, prevention, and contact investigation in "hard-to-reach" populations. Dr. J. F. Murray chaired a session entitled “IUATLD Contribution to World Lung Health,” which provided attendees with an understanding and appreciation of the problems encountered when delivering lung health care (asthma and TB care) to low-income countries, where 90% of the world’s population lives. Forty-one posters were presented at the CDC/ATS Public Health Poster Session. Drs. Paula Fujiwara and Charles Nolan co-chaired a standing-room-only symposium on "Dormancy and TB: Waking Up the Possibilities," which included topics spanning basic and clinical research, as well as the role of preventive therapy in the elimination of TB. Drs. James McAuley and Charles Nolan co-chaired a lively discussion on 25 posters related to TB epidemiology, diagnosis, and treatment. And, Dr. F. M. Gordin chaired a standing-room-only slide presentation on “TB Diagnosis and Treatment: State of the Art,” anchored by an opening featured speaker, Dr. F.M. Gordon, who gave an "Update on Preventive Treatment,” and a closing keynote address by Dr. Richard O'Brien entitled “TB Research: What Has it Contributed to TB Control,” outlining the pitfalls and progress that TB research has charted in the context of TB control and prevention. Another stimulating poster discussion session on "Issues in TB Transmission and Infection Control" was co-chaired by Drs. Kent Sepkowitz and Patricia Simone. Two other nondiscussion thematic poster sessions on TB were also held. Dr. Nancy Dunlap chaired a noontime session at which five National Heart, Lung, and Blood Institute (NHLBI) TB academic awardees presented their work in addressing the problem of inadequate education of health professionals, patients, their families, and the larger communities. Finally, Drs. Richard O'Brien and Donald Enarson co-chaired a poster discussion session on "Tuberculosis in a Global Context." On Saturday morning, April 25, the National TB Nurse Consultant Coalition (NTNCC) held a business and program meeting, which was followed by an afternoon business meeting of the National TB Controllers Association (NTCA).

As you can surmise by these diverse activities, we face very exciting times in TB prevention and control, and will continue to push ahead to achieve its eventual elimination.

Kenneth G. Castro, MD

In This Issue

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Number 1, 1998

HIGHLIGHTS FROM STATE AND LOCAL PROGRAMS

1996 HIV Counseling and Testing Survey of 12 New York State Counties

Summary

The New York State Department of Health, Bureau of TB Control (BTBC), conducted a two-part survey of 12 New York State counties regarding the HIV counseling and testing (HIV C&T) services that were offered by selected TB clinics to TB patients in 1996. Surveillance staff assessed the current practices used in TB clinics through interviews with county TB clinic staff, which documented perceptions of HIV C&T policies and practices, and through chart reviews, which assessed the actual practices of HIV C&T. There were consistent patterns among the 12 counties in the provision of HIV C&T to suspected and known TB patients. Eleven of the counties reported providing HIV C&T services at their clinics, while one county referred all patients to the county's STD clinic for HIV C&T. Staff from several counties reported time constraints, both for patients and staff, as a barrier to providing HIV C&T; the clinics were too busy or the patients did not have time to stay for HIV counseling and testing. Staff from many counties admitted having difficulties in documenting HIV information; however, they claimed to know the HIV status for most of their TB patients, even if it had not been charted.

Chart reviews highlighted other patterns. The percentage of patients with known (positive or negative) HIV status in the 20-44 age group for the 12 surveyed counties was significantly higher in 1996 (51%) than in 1995 (43%) (P value <0.05). Of the TB patients receiving care from both the county and a private provider, 85% had a known HIV status. This compares to 64% of county-only managed cases and just 45% of private provider–only managed cases. Of the 164 charts reviewed, 50% had no indication that an assessment of HIV risk factors had been done. Strategies for increasing the proportion of New York State (NYS) suspected and confirmed TB cases with a known HIV status have been identified.

Background

TB/HIV coinfection poses a major clinical challenge to the appropriate and effective management of patients. HIV infection results in immunosuppression, which speeds the progression of TB infection to TB disease. Persons with HIV and TB coinfection have a 10% chance per year of developing TB disease; immunocompetent persons have a 10% risk of TB over a lifetime. In addition, both TB infection and TB disease have been linked with increases in the HIV viral load for those coinfected. Finally, treatment of TB disease in HIV-positive persons is more difficult owing to drug interactions for those individuals on complex HIV treatment regimens. Persons with HIV infection may also require lengthier anti-TB treatment regimens owing to their immune suppression. Because of this, it is extremely important for TB providers to know the HIV status of TB patients, suspects, and confirmed cases under their care, regardless of age, sex, or

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TB Notes Editor
CDC/NCHSTP/DTBE, Mail Stop E10
1600 Clifton Road, NE
Atlanta, Georgia 30333
Fax: (404) 639-8960

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race/ethnicity.

HIV status has been requested as part of the national TB surveillance system since 1993. TB surveillance information not only documents the high rate of HIV seroprevalence among TB patients but also suggests that many persons are not being tested. For 1995 in NYS, HIV status was reported for only 26% of TB cases. Among persons 25 to 44 years of age, the age group most likely to be HIV positive, 46% of NYS (exclusive of NYC) TB cases had unknown HIV status. For 1996 in NYS (excluding New York City), 72% of known HIV-positive TB cases were found in the 20- to 44-year-old age group.

Methods

The 12 counties with the highest TB morbidity for 1996 (10 or more cases reported as of November 1996) were selected for this study. Patients studied were 20 to 44 years of age, were a member of the county's general community (not a state prison inmate), and were confirmed as having TB. The study population consisted of 164 individuals, representing 81% of the 202 TB cases reported for the 12 counties in the age group. Survey tools were created to 1) detect whether HIV status was known but not reported to the NYS TB registry, 2) identify barriers to providing HIV C&T or reporting HIV status, and 3) develop strategies to improve reporting of HIV status to the NYS TB registry.

New York State BTBC staff conducted interviews with county health department TB control staff to assess HIV C&T policies, procedures, and practices in the respective TB clinics. The staff who were interviewed consisted of key TB clinic staff involved with the actual provision of TB services to patients at more than 30 clinic sites and included public health nurses, supervising public health nurses, and TB control program coordinators. The number interviewed varied among counties, ranging from two to five. Bureau staff reviewed the medical charts of the study population to gather data on HIV risk assessment, counseling, testing, and HIV status, and also to find out how these data are recorded in the medical charts.

Findings

A. Interviews

Based on the interview responses, only one county provided HIV C&T to all TB patients (no referrals elsewhere for testing). One county did not provide any HIV C&T; this county referred all TB patients to the county's STD/HIV clinic for counseling and testing. The other 10 counties provided HIV C&T services as part of the TB clinic services, but also

referred patients for testing elsewhere (generally at the patients' request). Referrals were made to STD/HIV clinics primarily, but also to anonymous test sites and to private physicians. Two of these 10 counties specified that they referred only the non–English speaking patients for HIV C&T elsewhere, because language-specific services could not be provided on-site.

Of the 11 counties offering HIV C&T, six offered it to all clinic patients; four assessed patients' risks and offered testing accordingly. One county tested all cases of TB and assessed HIV risks for preventive therapy patients, offering HIV C&T only to those with risk factors. Six of the 11 counties excluded some patients from consideration for HIV C&T, such as children, the elderly, and persons not speaking English (due to a lack of reliable interpreting). Ten counties had educational materials about HIV and TB available in languages other than English, but only eight used interpreters to provide HIV C&T.

Six of the 11 counties referring patients elsewhere for HIV C&T reported barriers to obtaining test results from outside providers; either the test had not been done or the provider had failed to respond to requests for the information. All of the counties asked patients to self-report HIV status, but degree of follow-up of this information varied, from trying to get documentation, to encouraging a retest (especially if the last test was more than a year prior), to accepting the verbal report.

All of the counties reported barriers to providing HIV C&T in their TB clinics. One major barrier was patient refusal of HIV testing owing to the patient's perceived lack of risk factors, fear of a positive result, or cultural factors (particularly among the foreign-born). Another barrier was time; clinic staff members reported being very busy with little time to spare and indicated patients do not want to spend the 30-60 minutes in counseling. The process of interpretation was reported as a barrier to testing; use of interpreters was perceived as compromising the non–English speaking patients' confidentiality. Logistical barriers included limited space, staff, and time.

Staff from 10 of the 12 counties felt HIV C&T services could be improved. Half of the respondents reported that HIV C&T should be made a standard part of the TB treatment plan to make testing more routine and less likely to stigmatize the patient. Other suggestions included improving communication with community providers to increase testing, improving documentation in patient charts, and increasing both staff and clinic hours to make HIV C&T more available.

Most interview respondents reported knowing or having a strong idea of the HIV status of patients under their care. The county staff acknowledged that the HIV status may not be reflected in clinic charts or reports to the BTBC. In addition, difficulties in recording HIV status on the TB reporting forms were identified, such as confusion about codes and lack of a section to report information on follow-up reporting forms.

B. Chart Reviews

County medical charts were reviewed for 164 of the TB patients in the 20 to 44 age group from the 12 highest TB morbidity NYS counties outside of New York City. Over half (54%) of the TB patients had medical follow-up provided by the county health departments and 30% of the patients were followed only by a private physician. The remaining patients (16%) received follow-up care jointly from a county health department and private

physicians. There was a significant difference (P value <0.05) in known HIV status (negative or positive) for county-managed patients versus private physician–managed patients (see Table 1.) In addition, 85% of patients receiving TB care from both the county and a private doctor had a known HIV status.

Table 1

TB Case Management by Provider

Follow-Up Care Provided By:	n	%	% Known HIV Status (+ or -)
County	89	54	64%
Private Physician	49	30	45%
County & Private Physician	26	16	85%
Total Charts Reviewed	164	100	62%

Conducting chart reviews during the study resulted in a greater number of known HIV results than in the normal reporting procedure (see Table 2.) This indicated the need for county health departments to reassess their protocols for reporting HIV status to the NYS TB registry. The BTBC is revising forms, reports, and worksheets to encourage more accurate and complete reporting and updating of HIV status on TB cases.

Fifty percent had no mention of an HIV risk assessment being performed either during or before the TB work-up. Patients self-reporting HIV status were documented in 10% of the reviewed charts. The remaining charts had HIV risk factors documented as either present (18%) or ruled out (22%) (see Table 3).

Documentation of HIV results in the charts was found for 62% of the study population Documented known HIV status ranged from 53% to 100% for the 12 counties. Offers of HIV testing were documented in 27% of the charts. In 15% of the charts, documentation showed the HIV test had not been offered. Twelve percent of the patients refused HIV C&T and 4% had an HIV test, but the results were not known at the time of the chart review. In 9% of the charts, there was no documentation of an offer, refusal, test, or HIV result (see Table 3).

Table 2

Change in Reported Known HIV Status Over Time

HIV Status		Prior to Final Update by County	After Final Update by County	After Study
Total Known , + or -	n (%)	64 (39)	85 (53)	101 (62)

Of the 101 charts with documentation of HIV status, 65 had handwritten documentation of HIV status, 26 had copies of laboratory reports, and 10 had documentation from a hospital (discharge summary) or a local jail or had a copy of the initial TB reporting form (see Table 3).

Table 3
OVERVIEW OF COUNTY MEDICAL CHART REVIEWS

Criteria Reviewed	Range	N=164	
		number	%
Charts reviewed at a given county:	2 - 32	164	
TB patients whose follow-up care was provided by:			
County Health Department Only	0 - 83%	89	54
Private Medical Doctor Only	0 - 75%	49	30
CHD and PMD Both	0 - 50%	26	16
Charts reviewed at a given county with:			
"HIV risk factors present " documented in chart	0 - 50%	29	18
"HIV risk factors ruled-out" documented in chart	0 - 60%	36	22
HIV risk assessment NOT DOCUMENTED in chart	0 - 75%	82	50
"Patient self-reporting HIV status" in chart	0 - 50%	17	10
HIV test offered:	0 - 77%	45	27
Number of individuals HIV tested:		29	18
Reported HIV status by reviewed chart:			
HIV test not offered	0 - 40%	24	15
HIV test refused	0 - 29%	19	12
HIV test done, results not known (subject to change)	0 - 14%	6	4
HIV status unknown	0 - 25%	14	9
HIV status known (positive or negative)	53% - 100%	101	62
Charts reviewed at a given county with *known HIV (n=101) status documented by:*			
Copies of laboratory reports	0 - 71%	26	16
Hand written notes by nurse or MD	30 - 100%	65	40
Hospital discharge or jail medical summary	0 - 25%	6	4
On case report form only	0 - 25%	4	2

Comments
Survey activities resulted in three major findings: 1) In most counties, the TB staff did have knowledge of patients HIV status, whether or not the information had been reported to the state TB registry; 2) Barriers to the provision of HIV C&T were identified: time constraints, cultural differences, and language/translation problems; and 3) Areas for development of strategies to improve delivery and reporting of HIV C&T in NYS TB clinics were identified.

Chart reviews showed few of the surveyed counties had standard mechanisms for documenting HIV C&T. The BTBC recommends that each county health department adopt a standardized worksheet for recording the date and outcome of each patient's risk assessment, pretest counseling, test, and posttest counseling contact. This worksheet should be implemented as part of the TB treatment plan and included in the medical chart. The BTBC has drafted a worksheet that may be adapted to meet individual county needs.

In the interview, county TB staff suggested state reporting forms be revised to enable the county health department to more easily update the patient's HIV status. In addition, the chart reviews showed that a known HIV status was not being reported to the state TB registry if it was determined after the initial TB report had been submitted. To address this concern, the BTBC has revised the forms used to update case information and has asked counties to also record new HIV information at the time of case completion.

Unique barriers in individual counties included multiple county clinics with lapses in communication between the clinics and the central county office; reliance on outside providers to perform HIV tests with no communication protocol in place to transmit HIV information; and no communication protocol in place between county health departments and private health agencies and providers. The BTBC suggests improving both internal communication within the county's TB program offices and external communication between hospitals, jails, private providers, and the county TB program to address these problems.

The interview responses revealed that some private and public TB providers do not recognize the importance of HIV testing for all TB patients. County TB staff need to be involved in educating their own staff as well as private providers about the link between HIV and TB. Given the complex treatment issues involved with coinfected individuals, TB providers must recognize the clinical significance of TB and HIV coinfection and must confirm or rule out HIV infection for all TB patients.

We thank the 12 county TB control programs that participated in this study: Albany, Duchess, Erie, Monroe, Nassau, Oneida, Onondaga, Orange, Rochester, Rockland, Suffolk, and Ulster counties.

—Reported by John M. Brooks, MS; Marva Jeffery, MPH; Edwin Rodriguez, MHA; John C. Grabau, PhD, MPH; and Margaret Oxtoby, MD
New York State Department of Health, Bureau of TB Control

Charleston, Missouri, TB Testing Project

The Charleston TB Testing Project was initiated because of the number of active cases of TB that had occurred in a particular section of Charleston, Missouri, since 1981 and the number of reports of TB infection without disease in the same section of Charleston since 1991, when TB infection became a reportable condition in Missouri. The reporting of TB infection was initiated in Missouri in 1991 as a Department of Health rule. This rule was implemented in order to identify those individuals at high risk of developing TB and initiate those actions necessary to prevent active disease. The TB

infection register will enable Missouri's TB program to focus on the reservoir of infection as the incidence of active disease declines. A physician, physician's assistant, or nurse providing the care is responsible for reporting TB infection or disease to a local health authority or the Missouri Department of Health. The local health authority must forward these reports to the Department of Health within 24 hours after they are received.

CASES IN CHARLESTON

From 1981 - 1997
29 cases of active TB
69% (20/29) lived in Southwest area of Charleston

From 1991 - 1997
39 reports of TB infection

The main concern was not so much the number of cases of disease or reports of infection that were occurring, but the fact that most of them were occurring in a particular area of Charleston. For this reason, the Mississippi County Health Department and the Missouri Department of Health approached the community about forming a partnership to organize a skin-testing initiative to find individuals who might be transmitting the disease and to prevent people from developing the disease. The plan for TB testing was presented first to the Mississippi County Board of Health for their endorsement. Then the TB problem was discussed with additional community leaders to make them aware of the problem. The community leaders of the Charleston Ministerial Alliance played a key role in educating the community about TB. The ministers requested 500 fliers that would fit in church bulletins; on one side, the flier had educational information about TB, and on the other side, it provided information about the TB testing that would be done in January 1998. After information went out in the church bulletins, TB control staff met with those who were willing to assist with the project, obtained their commitments to help, and determined the type of assistance they could provide. We met again with the volunteers who would hand out fliers about TB. Fourteen community volunteers then went door-to-door in the community the Saturday before the testing date. They talked with people about the testing project and handed out fliers as reminders. From New Year's Eve through the following weekend, a local supermarket, a Wal-Mart, and a local liquor store placed the fliers in shoppers' grocery bags. In addition, TB posters were placed in stores and public offices along with a flier announcing the skin testing project. The media coverage was another key part to the success of this project. Both of the local newspapers carried front-page articles and ran ads about the testing project.

The testing was conducted on Tuesday, January 6, 1998, from 9:00AM to 1:00 PM and again from 5:00PM to 8:00 PM at the Helen Currin Community Center in the southwest section of Charleston. The tests were read on Thursday, January 8, 1998, at the same location and the same time. There were 264 people tested, and 245 test results read. On January 6, a total of 30 volunteers and local and district office staff helped with the testing. The volunteers completed paperwork for the people who were tested, served refreshments, and provided transportation to and from the site. Volunteers continued to talk with people in the community to make them aware of the testing project. On the day the tests were read, volunteers took the list of names of those tested and called to remind them to return for the reading of the test. They again provided transportation and assistance with paperwork and handed out McDonald's coupons.

Incentives were used to motivate people to receive the test and to return to have their test read. The incentives included refreshments such as cookies and punch the

day of the testing. As mentioned above, $2 McDonald's coupons were given out when the test was read as a reward for returning.

No one has been found to have active disease as a result of the testing. Thirty-two people were found to have positive (or reactive) skin tests. After questioning them, the nurses were able to determine that nine of these individuals had positive skin tests in the past. It was stressed to these individuals that they did not need to have a TB skin test again. It was found that six of those with positive skin tests were known by the health department to have been contacts of a person who had been diagnosed with TB within the past 9 months. Twelve individuals were determined to be candidates for preventive medication because of their various risk factors.

In summary, many people, both volunteers and staff, worked together to make this community mobilization project a success. Community members played a key role in mobilizing the residents to take action. Without their involvement and commitment, we would not have been successful with this project. This project is an excellent example of what can be accomplished to achieve a common goal when the state department of health, a local public health agency, and the residents of a community work together. Other local agencies, businesses, and the local press were all great assets to this project as well.

—Reported by Lynn Tennison, RN, and Vic Tomlinson
Missouri TB Control Program

The AT&T Language Line Services® for TB Clients: Delaware's Experience with Success

The Objective:
The Delaware Division of Public Health's TB Elimination Program had one very important objective to achieve: Assure TB clinic staff access to interpretation services for clients who speak little or no English. The TB program contracted with the AT&T Language Line Services® to effectively overcome the problems posed by more traditional interpretation services.

The Challenge:
With the dramatic increase in the proportion of foreign-born clients presenting with both active disease and latent infection, language barriers became one of the major challenges of the 1990s for TB clinic staff. In 1996, 37% of Delaware's reported cases were in the foreign-born, as compared to 18% in 1990. Concomitantly, more than 50% of the persons starting preventive therapy from 1993 to1996 were foreign-born. Traditionally, we had relied on the bilingual talents of two TB nurses who are at one site only and on community interpreters statewide who were in short supply. More often than not, friends and family members were asked to assist. The TB Elimination Program determined that these methods were not effectively meeting the needs of clients or staff. With input from clinic staff and financial support from our CDC TB Cooperative Agreement award, we implemented a new strategy.

Features of the AT&T Language Line Services® for better customer service:
Staff can better serve clients using a telephone with the conference feature and following five basic steps to access translators who speak 140 languages, 7 days a week, 24 hours a day. We anticipated the majority of our calls would occur between Monday and Friday, 8:00AM – 5:00 PM, with some exceptions. The TB program pays a monthly minimum charge plus rates for the calls. Rates vary according to domestic versus international access and peak time versus non–peak time of day.

To use the service in your meetings with clients, call the 800 access number, give the operator the identification code assigned to your organization, and indicate which language is required. In less than a minute,

an interpreter will be on the phone to assist you and your client. Using the speaker phone or conference call feature of your phone, describe to the interpreter the information or concept you are trying to explain, and the interpreter will immediately translate that information for the client.

TB clinic staff received training during a routine quarterly meeting facilitated by the TB program manager. The training demonstrated how over-the-phone interpretation improves face-to-face encounters with clients and how the service allows you to handle inbound calls from non–English speaking clients.

Training materials provided by AT&T Language Line Services® for clinic staff include

- A videotape demonstrating outbound and inbound call service
- An 800 test number, an 800 access number, and an emergency number
- A user's guide
- A quick reference guide with important tips
- A language identification card
- Wallet cards for staff

Management services and tools for the TB controller/administrator include

- Easy access to your account management specialist
- Friendly, professional responses to inquiries
- Detailed invoices by program codes you select
- Year-to-date performance reports

The TB program extended the opportunity to other client service-delivery programs in the Division of Public Health that were willing to share the costs for the contractual service. Customer satisfaction among staff has been very high. Utilization has gone from one encounter at its inception in September 1997 to 46 calls in January 1998; the average call is 11.5 minutes and the average time to connect with a translator is 49.3 seconds. The service has benefitted clients statewide who speak six different languages including Spanish, Haitian Creole, Korean, Thai, Portuguese, and Turkish (in descending order). Approximately 70% of the interpretations were for clients seeking TB-related services.

Next steps

The TB Elimination Program will continue to assess the benefits of the service for clients and staff. The average cost of an over-the-phone interpretation for clients served by the Delaware Division of Public Health is $43.60. We think the investment is reasonable when one considers the service delivers convenient real-time, online access and offers an unparalleled scope of languages and dialects; this is in contrast to the cost of onsite interpreters at $20.00/ hour who may or may not be available in urban and rural Delaware, have no formal training in the area of medical services, and are usually limited to one dialect.

If you would like to learn more about this service for your TB Program, visit the AT&T Language Line Services® web site at **http://www.att.com/languageline.**

—Submitted by Kathleen Russell, MPH
Delaware TB Elimination Program

Texas Correctional Facilities Workshops

Federal legislation under Title III of the Violent Crime Control and Law Enforcement Act of 1994, P.L. 103-322, provides for grants to state, Indian tribal, and local correctional and public health authorities to assist in establishing and operating programs for the prevention, diagnosis, treatment, and follow-up care of TB among inmates of correctional institutions. Texas was one of five states invited to participate (in addition to California, Florida, Illinois, and New York). These states have large correctional populations as well as being the top five states for TB morbidity. Matching funds of up to $40,000 were available to each state (this was for the entire

project including both the health department and the department of corrections combined). The departments were to develop a grant application that would enhance coordination among state and local correctional agencies and public health authorities to reduce the spread of TB.

In April 1997 the Department of Justice (DOJ), Office of Justice Programs, Corrections Program Office, sent requests for grant applications to the five states. These requests went to the state departments of corrections, and the corrections department then supplied the DOJ with a contact person in the TB program at the state level. The applications were due 30 days after the meeting and the funds were awarded in late June or early July.

Each state working group could decide what type of project they wanted. The DOJ had identified several potential outcomes that could be achieved through collaborative efforts between health departments and correctional authorities --such as

- A better understanding of the problem of TB in correctional facilities at the state and local level
- An enhanced commitment to take advantage of the opportunity to diagnose and treat infected individuals while in custody
- Improved communication and cooperation between public health and prison authorities
- Reduced incidence of undiagnosed and untreated TB infected inmates being transferred to state correctional facilities or released back into the community.

Under the grant, the Texas Department of Health and the Texas Department of Criminal Justice collaborated to offer information about TB control to employees of correctional facilities and others who have an interest in correctional health care issues. Local health department and correctional persons assisted with the planning and the site selections. Four TB educational workshops were offered in areas that differ geographically and that have different kinds of correctional facilities and varying inmate populations: west Texas (Midland), north Texas (Arlington), central (Huntsville), and southwest (San Antonio). The workshops, entitled “TB Control in Correctional Facilities,” provided an overview of TB as well as presentations on the diagnosis and treatment of TB, health department issues, institutional issues, infection control, TB control statutes, and records management. The target audience for the programs consisted of correctional staff (medical personnel as well as correctional officers and administrators), local health department medical staff and administrators, and hospital medical personnel. The first meeting was held in Midland on November 4 and 5. The planned-for attendance was 100; 118 persons registered, while the actual attendance was 136. The other workshops were equally well attended (in San Antonio, 150 were expected and 160 attended; in Huntsville, 200 were expected and 240 attended), although weather difficulties affected attendance somewhat in Arlington (100 were expected and 93 attended). The faculty for the sessions were drawn from local health departments and state regional health departments hosting the program; the state, county and local correction programs; state regulatory agencies; the Federal Bureau of Prisons; the Immigration and Naturalization Service; the National Institute for Occupational Safety and Health; and the State Health Department. The faculty varied from program to program but the agenda topics remained the same. An important aspect in the success of the workshops was the cooperation among the various collaborators; for example, various institutions donated the use of valuable conference space for the workshops.

Initially, the program scheduled for March 16 in Huntsville was to be the last. However, the Texas Department of Health was given permission by the DOJ to offer two additional conferences since there was money left, the

previous programs had been so well attended, and the responsiveness of the audiences (questions asked and information shared) had been great. These two additional sessions have been planned for south Texas (South Padre Island) and east Texas (Tyler).

In order to evaluate these workshops, pretests and posttests were administered at each session. However, because of the addition of the last two sessions, this process is not yet complete. Because of the positive response to the workshops and the subsequent requests that have been received for additional sessions, the Texas Department of Health supports correctional health care programs and would offer additional sessions if funding again becomes available.

—Reported by Phyllis Cruise
Texas TB Control Program

Announcing the *Public Health Prevention Service*
A New and Unique CDC Program

CDC's new Public Health Prevention Service (PHPS) program is seeking challenging 2-year work assignments in state and local health departments for 25 PHPS Prevention Specialists. All salary, benefits, and relocation allowances are covered by CDC.

About the program...
The PHPS program was established in 1997 with the primary objective of preparing a work force skilled in planning, implementing, and evaluating scientifically sound prevention programs and interventions. The PHPS program is committed to the development of Prevention Specialists with multiprogram, multijurisdictional, and broad-based practical experience.

The PHPS program is one of training and service. To accomplish this, the PHPS program supports the placement of Prevention Specialists in two different 6-month assignments at CDC, followed by a 2-year assignment at a state or local health department. The assignments at CDC include experiences in translating science into practice, policymaking, and program development from different program perspectives. Formal and informal training at CDC is provided in the skill areas of 1) analysis and/or epidemiology, 2) public health science, 3) management/planning and policy, 4) health services organizations, 5) communication, 6) community relations, and 7) professional and cultural skills. A PHPS fellow, Nancy Eberle, MPH, was assigned to DTBE between September 1997 and March 1998 to collaborate with the NTCA on the development, implementation, and analysis of a survey of the impact of managed care on TB control.

Skilled staff
The Prevention Specialists enter the PHPS with a master's degree in a health-related field and several years' experience working in public health. Each of the Prevention Specialists works in two different programmatic areas during the first year at CDC. This assignment provides them an opportunity to develop their program-building skills, deepen their understanding of how policy and programs are developed, and develop an understanding of funding decisions made at the national level.

State and local health department assignments
The 2-year assignments at a state or local health department are intended to provide direct, hands-on work with communities and local public health issues. These assignments should be based on sound public health practice and afford the Prevention Specialist an opportunity to work in the areas of program design, implementation, and evaluation.

How to request a Prevention Specialist
Interested state and local health departments are encouraged to complete a position description. State and territorial health

officers and county and city health officials have also been provided with information about the request for 2-year assignments. *For additional information call the PHPS Program at 404/639-4087 or e-mail your questions to* <***phpsepo@cdc.gov>.***

—Submitted by John Lehnherr, NCHSTP, and Dennis Jarvis, EPO

Continuing Nursing Education Units (CNEs) Available for *Self-Study Modules on TB*

The *Self-Study Modules on Tuberculosis* are now approved for 24 continuing nursing education units (CNEs). The series of five print-based modules provide basic information about TB in five core areas: Transmission and Pathogenesis of TB, Epidemiology of TB, Diagnosis of TB Infection and Disease, Treatment of TB Infection and Disease, and Infectiousness and Infection Control. The modules were designed to provide consistent information to all students regardless of the delivery environment or the differences in the knowledge levels of local trainers.

A second product, *A Satellite Primer on TB*, a five-session interactive satellite broadcast course, was designed to enhance the information in the *Self-Study Modules on Tuberculosis.* These two products together won an award from the International Society for Performance Improvement for Outstanding Instructional Product in 1996.

Although the original target audience for the modules was entry-level health care workers, both the self-study modules and the satellite course attracted an audience that consisted predominantly of nurses (70%). The *Self-Study Modules on Tuberculosis* were previously approved for continuing education units (CEUs); however, the demand for the modules by nurses led to the pursuance of CNE accreditation as well.

To register for CNEs or CEUs for the print-based *Self-Study Modules on Tuberculosis*, individuals should call the CDC's Public Health Training Network at 1-800-41-TRAIN. This course is offered free of charge. Participants can take the course individually or study with a group.

Individuals who do not want to register for CNEs or CEUs but would like to request a copy of the *Self-Study Modules on Tuberculosis* should call the CDC Voice and FAX Information System toll-free at (888) 232-3228, then select 2, 5, 1, 2, 2, 2, and request *Self-Study Modules on Tuberculosis*, Order #00-6514. Videotapes of *A Satellite Primer on Tuberculosis* can be ordered from the Alabama Department of Public Health at (334) 206-5618.

CNE approval for the *Self-Study Modules on Tuberculosis* offers a unique opportunity for nurses throughout the United States to obtain basic knowledge about TB. This is especially significant for non–health department nurses who would not normally be provided with TB information, but who may serve at-risk populations. This might include nurses working in such sites as correctional facilities, drug treatment centers, homeless shelters, nursing homes, migrant clinics, and other facilities that serve persons with or at risk for TB.

We encourage you to promote the Self-Study Modules on Tuberculosis to build skill capacity with partners in your city and state. Reaching nurses currently working in TB, as well as those outside of the TB realm, will help further our goals for the prevention and control of TB.

—Reported by Nickolas DeLuca, MA Division of TB Elimination

UPDATES FROM THE RESEARCH AND EVALUATION BRANCH

Why Is it Important to Consider Anergy in Assessing the Need for TB Preventive Therapy in Patients Infected with HIV?

Persons infected with human immunodeficiency virus (HIV) are at risk for active TB, either from reactivation of a latent infection or rapid progression of a newly acquired TB infection. HIV infection is the most potent risk factor known to increase the likelihood of presenting with active disease if infected with *M. tuberculosis*. We are also aware of the growing evidence that active TB appears to accelerate the evolution of HIV-related disease, possibly through an increased production of cytokines and accelerated HIV replication.

Therefore, it is important to offer HIV-infected patients the best management possible for the prevention of TB. However, our ability to provide optimal prevention interventions is sometimes impaired because HIV-related immunosuppression is associated with an elevated risk for anergy, and in turn anergy causes false-negative reactions to PPD testing and difficulty in the diagnosis of latent tuberculous infection.

In 1991, CDC published guidelines recommending that anergy skin testing be performed in conjunction with PPD-tuberculin skin testing for HIV-infected persons who were being evaluated for infection with *M. tuberculosis*. Demonstration of anergy in these patients was recommended as an indication for isoniazid preventive therapy. Since the publication of these guidelines, several studies have examined the results of anergy and PPD skin testing, as well as the effect of isoniazid for the prevention of TB in anergic, HIV-infected persons. In February 1997, CDC convened a meeting of consultants to discuss these recent publications and other available data. CDC then prepared an updated report about the use of anergy testing for HIV-infected persons in the United States. This report was published in the September 5, 1997, issue of the *MMWR*.

What is anergy testing and how is it done?

Anergy testing is in reality many things done in many different ways. The purpose of doing anergy skin testing is to assess responses to skin-test antigens to which a cell-mediated, delayed-type hypersensitivity (DTH) response is expected. Persons who have positive skin test results are considered to have intact cell-mediated immunity, or CMI. Persons with no DTH response are considered anergic and at elevated risk for complications of deficient CMI. PPD-tuberculin skin testing itself elicits a DTH reaction, so persons who have positive PPD responses are not anergic.

Mumps and *Candida* antigens are the currently available FDA-approved products for anergy testing. Mumps skin-test antigen has been available longer and its use has been validated in a study that found that a lack of response to mumps antigen was associated with an increased risk for TB in HIV-infected persons. *Candida* DTH skin-test antigen was approved more recently. Data linking a lack of response to this *Candida* antigen and the risk for TB are limited since published studies that have included testing with *Candida* have mostly used different products marketed as allergenic extracts, and not the currently available *Candida* antigen for DTH testing. Fluid tetanus toxoid is another antigen frequently used for anergy testing, but with variable preparations, dosages, and dilutions.

DTH antigens should be administered using the Mantoux method for intradermal testing, and have a conventional cut-off measurement of 5 mm for interpreting these

tests as positive. To date, studies of anergy testing in conjunction with PPD testing have used a variety of control antigen preparations and of skin-test administration and reading procedures. The use of at least two control antigens is standard practice for anergy testing; however, there is almost no information published regarding the performance of the FDA-approved mumps and *Candida* antigens used together in testing. The information gathered from studies that used panels of multiple-DTH antigens suggests that testing with several (possibly 3 or more) antigens may be necessary to maximize the likelihood that all persons able to respond are identified. Also of note is that serial anergy testing among HIV-infected persons has shown unpredictable differences over time, and it is not clear whether this variation is a result of changes in host immune competence or changes in the characteristics or the interpretation of the tests themselves.

The lack of standard methodology and the dearth of outcome data based on uniform antigens and tests are great obstacles for evaluating the effectiveness of anergy testing and its role in making decisions concerning TB preventive therapy. However, for those situations when anergy testing is performed, there are some important issues to remember. First, it is clear that the results of anergy testing must always be supplemented by information concerning the person's risk for exposure and infection with *M. tuberculosis*. Second, it is important to consider the purpose of anergy testing: if the primary concern is to avoid misclassifying anergic persons as nonanergic, using two Mantoux-method tests with 5-mm cut-offs may be sufficient. However, if the primary concern is to avoid misclassifying immunocompetent persons as anergic, it may be necessary to use three or more antigens. In all cases, the expertise of the health-care provider and an understanding of the limitations of anergy testing are the most critical issues for their appropriate use.

What is the connection between anergy, HIV disease, and active TB?

Several studies have shown that impaired DTH response, which is directly related to decreasing CD4+ T-lymphocyte count, is a predictive factor for progression to AIDS and mortality in HIV-infected persons. Two African studies have also suggested that mortality may be increased in HIV-infected persons who have active TB and who do not respond to testing with PPD, compared with HIV-infected patients who have TB and who respond to PPD testing. The results of several U.S. and international studies have indicated that HIV-infected persons diagnosed as anergic, regardless of the method that was used for the assessment of anergy, have a greater risk for active TB than do nonanergic, PPD-negative, HIV-infected persons from the same populations. The risk of TB in these groups has ranged from 0 to >12 per 100 person-years. However, neither the nature nor the magnitude of this association has been proven conclusively.

One potential explanation is that the risk for active TB in these persons may be associated with ongoing risk for *M. tuberculosis* transmission rather than with a high probability of latent *M. tuberculosis* infection alone. This would explain the findings in the most recent multisite U.S. study, in which there was an increased risk of TB associated with residence in areas (East Coast) with high TB case rates. High transmission rates may also explain the results of studies conducted in other countries with higher TB transmission rates than the United States. This reasoning would also imply that any effect of preventive therapy in anergic subjects might be attributable not only to prevention of reactivation of latent infection, but also (or instead) to primary prophylaxis against new acquisition of infection with *M. tuberculosis*.

How is anergy testing useful or not useful for the interpretation of the tuberculin skin test?

The results from anergy testing done in conjunction with PPD-tuberculin skin testing have been interpreted in two ways: 1) a positive DTH response with a negative PPD skin-test result probably means that the negative PPD test result is a true negative and the person is not infected with *M. tuberculosis*; 2) a lack of DTH response with a negative PPD result is probably evidence that the person is immunodeficient and unable to mount a response to PPD; the person could be infected with *M. tuberculosis*.

Certain issues, however, bring these interpretations into question. First, patients may still respond to other antigens even after losing PPD reactivity. We know, for example, that some patients with active, culture-positive TB occasionally do not react to PPD. In one recent study, subjects retained mumps reactivity after losing PPD reactivity because of HIV-related immunosuppression, and PPD boosting occurred in some persons with an initial positive reaction to control antigens. Therefore, a DTH response with a negative PPD does not prove absence of infection with *M. tuberculosis*.

Second, a lack of response to one or more control antigens does not always mean inability to respond to PPD. In populations in which the prevalence of tuberculin reactivity is high, the percentage of persons who react to PPD may be higher than the percentage reacting to several other antigens. Even in populations in which the prevalence of PPD positivity is low, some persons respond to PPD testing despite lack of response to a companion antigen.

Last, a valid demonstration of anergy **does not predict infection with *M. tuberculosis***; instead it indicates that, for the anergic person, the PPD test results may not be useful in judging the likelihood of infection with *M. tuberculosis* and the need for preventive therapy.

What is the effect of TB preventive therapy on HIV-positive anergic persons at high risk for infection with *M. tuberculosis*?

To answer this question, we considered the results of two placebo-controlled studies of 6 months of isoniazid therapy in anergic persons at risk for tuberculous infection. The U.S. study found no statistically significant effect of therapy, despite a 56% reduction in rates of TB from 0.9 per 100 person-years in placebo recipients to 0.4 per 100 person-years in isoniazid recipients. The lack of statistical significance associated with a 56% efficacy rate appears to have been a result of a lower-than-expected TB case rate in placebo recipients. The researchers of this study concluded that because the TB rate in the untreated group was very low, **preventive therapy would have minimal impact in reducing the number of incident TB cases but would result in a substantial number of uninfected persons being treated with isoniazid.** The other study conducted in Kampala, Uganda, demonstrated a high TB case rate (3 per 100 person-years) in placebo recipients, but only a statistically insignificant (17%) reduction in isoniazid recipients.

Should anergy testing be included in TB prevention and control programs?

Anergy testing in conjunction with PPD-tuberculin testing is no longer routinely recommended for inclusion in screening programs for *M. tuberculosis* infection among HIV-infected persons. However, it is possible that DTH evaluation may help in making individual decisions regarding TB preventive therapy in selected situations or patients.

When is TB preventive therapy recommended for HIV-positive patients?

Unless specifically contraindicated, preventive therapy should be administered to HIV-positive persons who a) have positive reactions to PPD tuberculin (greater than or

equal to 5 mm of induration), b) who have not already been treated for TB infection, and c) whose test results exclude active TB. This preventive therapy is indicated even if the date of PPD skin-test conversion cannot be determined. If the patient is a contact of a person with infectious TB, a full regimen of preventive therapy should be given, regardless of whether or not there is a history of previous preventive therapy.

When assessing HIV-infected persons who have negative PPD-tuberculin skin-test results or who are known to be anergic, the most important issue in considering TB preventive therapy is the likelihood of exposure to transmissible active TB and the likelihood of latent *M. tuberculosis* infection. For example, it is clear that preventive therapy should always be considered for those who have had recent contact with infectious pulmonary TB patients. Situations where the need for preventive therapy is less clearly defined: a) children born to HIV-infected women and close contacts of a person with infectious TB, and b) HIV-infected adults who reside or work in institutions and who are continually and unavoidably exposed to patients with infectious TB; for example, inmates of prisons in which the prevalence of TB is high and outbreaks of TB are occurring.

In summary, what does the updated CDC report conclude about anergy testing in the United States?

1. Presently, because the results of anergy testing in U.S. populations do not seem useful in making decisions about TB preventive therapy, anergy testing is no longer recommended as a routine component of TB screening among HIV-infected persons in the United States. The main reasons for not recommending this procedure:
   - The variability in the available anergy testing methods, as well as their lack of reproducibility and their complexity, are all factors that limit their usefulness.
   - Although the precise risk for TB in HIV-positive anergic persons in the United States cannot be determined, the overall risk appears to be very low.
   - In studies conducted in the United States in which preventive therapy was administered primarily to anergic persons, the efficacy of this intervention was not demonstrated.
   - In the United States, the public health impact of finding and treating patients who have infectious TB and of providing preventive therapy to PPD-positive, HIV-infected persons should be greater than the effect of preventive therapy for HIV-positive anergic persons.

2. Because several studies have suggested that impaired DTH is related to an increased risk for active TB in some HIV-infected populations, the report concludes that in **selective** situations, anergy testing may be useful, despite the known problems associated with different anergy skin-testing procedures.

The report also concludes that

- When a clinician elects to use anergy testing as part of an assessment of a person's risk for TB, the use of the two FDA-approved Mantoux-method tests together (mumps and *Candida*) and with cut-off diameters of 5 mm of induration is recommended.

- Clinical trials using the currently available antigens and the recommended anergy testing methodology may provide data that are useful in making future decisions about the program application of these tests.

- Improvements in TB screening and preventive therapy practices in HIV-infected persons call for more standardized anergy testing methods and a validation of their predictive value; more importantly, they require another way to

measure CMI or to test for latent TB infection.

—Reported by Elsa Villarino, MD, MPH
Division of TB Elimination

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INTERNATIONAL NOTES

Overseas Screening for TB among U.S. Immigrants: Decision Analysis

Background
Since December 1996, CDC and Health Canada (Quarantine Health Services Unit) have been reevaluating the current overseas medical assessment of migrants coming to North America. At a June 1997 meeting in Ottawa attended by personnel from CDC's Division of Quarantine (DQ) and Health Canada, eight diseases, including tuberculosis, were chosen for the "pilot" reevaluation. For each disease, CDC is developing a preliminary decision analysis and Health Canada a simplified algorithm. The TB decision analysis is a cooperative effort between CDC's DQ and DTBE.

Currently, overseas medical assessment of potential immigrants and refugees for TB serves to identify a) infectious (smear-positive) cases of active TB that require some level of treatment before entry into the U.S., and b) cases of active or latent (with a likelihood to reactivate in the future) TB that require follow-up in the U.S. Even with this assessment, 30% of TB cases among the foreign-born are diagnosed within 1 year of their arrival in the U.S. CDC's data showed that by 1995, foreign-born persons represented 35% of the national total of active TB cases. More than 60% of these cases were in people from seven countries: Mexico, Philippines, Vietnam, China, India, Haiti and Korea. (1995 data are presented here to be consistent with our use of 1995 data in the decision analysis.)

Because of the regional differences in numbers of foreign-born TB cases, the "pilot" TB decision analysis examines the outcomes of various screening strategies for three geographic areas: Asia (Philippines data), Latin America (Mexico data), and a low prevalence region (aggregated data from 10 European countries). The cost-effectiveness of the current overseas TB assessment of potential immigrants from these regions is included in the analysis.

Methods/Results
Decision analysis is an explicit, quantitative, and systematic approach to decision-making. It is a tool that can complement human expertise and judgment, and identify areas where more data is needed. It is used when *real* options to choose from exist, but the *best* option to choose is unclear, and when the consequences of the decisions to be made are important and far-reaching. There are three major steps in decision analysis: 1) frame the problem, 2) construct a decision tree, and 3) interpret the results.

- The purpose of the current overseas medical assessment is to identify immigrants with smear-positive TB who require some therapy prior to emigration and with active or likely to reactivate TB who require follow-up after emigration. A screening chest x-ray is performed and followed by sputum exams if indicated. This screening is designed to prevent transmission by a) excluding those with smear-positive TB (Class A, active infectious TB), and b) identifying persons whose chest x-rays are compatible with active TB, but are smear-negative (Class B1) or old, healed TB (Class B2) for further evaluation after their U.S. arrival. The decision analysis asks the question "Should all immigrants be screened for active infectious TB prior to entry into the U.S., regardless of country of origin?" given limited financial and human resources here and abroad for TB screening. Two options are compared for the three geographic regions: *no screening* and *screening with a chest x-ray and follow-up sputum smear* .

- The branches of the decision tree, shown condensed in the figure, include probabilities for the likelihood of active TB, follow-up in the U.S., diagnosis within

1 year of arrival, drug-resistant TB, receipt of immediate care and treatment, and being infectious. Direct medical costs expressed in 1996 U.S. dollars include physical exams by overseas physicians, follow-up physical exams by local public health departments, and inpatient and outpatient care and treatment of newly diagnosed, active TB cases regardless of who pays. Costs for close contact investigations and care and treatment of TB-infected close contacts are included in additional analyses. Two decision trees are constructed for each geographic region: one to determine the average number of active infectious TB cases per immigrant screened and not screened, and another to determine the average cost per immigrant screened and not screened.

- The results of the "pilot" decision analysis are presented in the Table for a hypothetical cohort of 10,000 newly arrived immigrants. Possible secondary transmission to close contacts is not included in these results, but it is considered in additional analyses.

The cost (or savings) per active infectious TB case excluded by screening is derived for each geographic region. According to this analysis, screening immigrants from Asia is effective and results in cost-savings. By contrast, screening immigrants from Europe and Latin America excludes fewer active infectious TB cases at a much greater cost. The general pattern of results remains constant over a range of plausible values for the prevalence of active TB, the costs of screening here and abroad, the costs of care

Outcomes per 10,000 newly arrived immigrants	**Geographic Regions**					
	Asia		**Europe**		**Latin America**	
	No Screen	**Screen**	**No Screen**	**Screen**	**No Screen**	**Screen**
Average number of active *infectious* TB cases						
Drug-resistant	35	6	0	0	4	4
Drug-susceptible	129	20	8	7	14	11
Total	164	26	8	7	18	15
Average number of act. *noninfectious* TB cases						
Drug-resistant	91	16	0	0	1	1
Drug-susceptible	487	90	16	16	6	7
Total	578	106	16	16	7	8
No active TB	9258	9868	9976	9977	9975	9977
Average cost	$8,060,300	$2,023,000	$226,400	$1,381,400	$275,500	$1,248,400
Cost (savings) per active *infectious* TB case excluded	($43,749)		$1,155,000		$324,300	

and treatment for active TB, and the number of close contacts per active TB case. If overseas screening costs are excluded from the analysis, screening may result in cost-savings in all three regions.

Conclusions

Based on the results of this "pilot" decision analysis, screening for TB among immigrants appears to be effective at excluding active infectious TB cases from the U.S., but how many and at what cost (or savings) to public health agencies depends on the region/country of origin. This analysis shows the lack of savings for overseas TB assessment of potential immigrants from regions with low TB prevalence rates. Future consideration should be given to

- further reexamination of the need for TB assessment in regions where the prevalence is low and the cost of the overseas medical assessment is high,
- the stratification of TB risk according to regional prevalence rates, and
- the ability to adjust medical assessment policies by region as is currently done for different age groups (e.g., persons <15 years do not routinely undergo chest x-rays).

Recommendations

The decision analysis presented here can be used to conduct further empirical research on TB screening among immigrants by

- modifying the basic decision-tree structure to address the underlying assumptions,
- collecting region- and country of origin-specific probabilities and costs, and
- estimating the service delivery impact on the U.S. public health care system.

Additional applied research activities could include

- documenting the costs and health outcomes of Class A, B1, and B2 visa applicants,
- focusing the decision analysis on other target populations (adjustment-of-status persons and refugees) and screening options (using chest x-rays and TB skin testing), and
- using state/local public health department data in a modified version of the basic decision tree.

Throughout this process, the potential ethical, legal, political, and social effects of region/country of origin-specific TB screening should be considered in developing future policies and programs.

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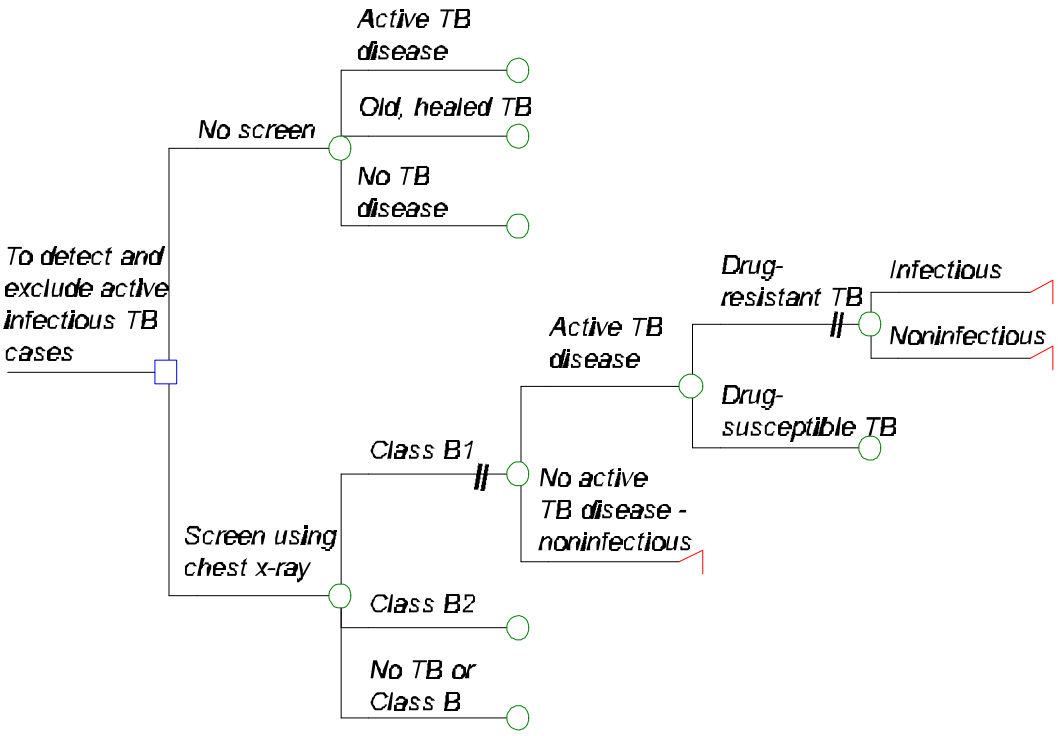
We would like to acknowledge the valuable contributions of our CDC collaborators on this decision analysis: Drs. Zachary Taylor, Nancy Binkin, and Mona Saraiya and Ms. Cristy Nguyen in DTBE, Dr. Vilma Carande-Kulis in the Division of Prevention Research and Analytic Methods, and the editorial contributions of Ms. Ava Navin in the Division of Quarantine.

—Reported by Noreen Qualls, DrPH, Division of TB Elimination and Susan Cookson, MD, Division of Quarantine



Binational TB Laboratory Activities on the U.S./Mexico Border

In January 1997, a U.S./Mexico Border Tuberculosis Laboratory Planning meeting was held in El Paso, Texas, to focus on an action plan for issues of cooperation, collaboration, and infrastructure-building for laboratory support of TB control. This meeting was cosponsored by the CDC, the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD), and the Instituto Nacional de Diagnostico y Referencia Epidemiologicos (INDRE), with attendance from representatives of the four U.S. and six Mexican border state laboratories, the Pan American Health Organization, and Ten Against TB (TATB). The meeting participants formulated an action plan for future collaborative efforts between the U.S. and Mexican laboratories at the state and national level. Highlights of this action plan include proposals for 1) collaborative training efforts that focus on microscopy and culture isolation of *M. tuberculosis*; 2) initiatives to identify equipment needed to increase testing capacity in the Mexican state laboratories; and 3) the need to form a consortium of the U.S./Mexico border state laboratories to increase communication on TB and other public health issues. The following are several initiatives for training, infrastructure, and quality control that focus on improving TB laboratories on the U.S./Mexico border.

Training

In response to action items developed at the El Paso meeting, a 4-day training course in culture methods was developed and presented in October 1997. The intensive, hands-on laboratory training experience in smear and

culture methods was facilitated by the Pacific Office of the National Laboratory Training Network, and convened at the Microbial Diseases Laboratory of the California Department of Health Services. Faculty for this workshop consisted of the leading mycobacteriologists from California, Arizona, New Mexico, Texas, INDRE, and ASTPHLD. Participants represented the state laboratories of Tamaulipas, Nuevo Leon, Sonora, Chihuahua, Coahuila, Baja California, and Mexico City. The course was designed to enhance fundamental laboratory skills in isolating and detecting*M. tuberculosis*, to outline required quality assurance practices, and to strengthen partnerships between U.S. and Mexican mycobacteriologists.

The next phase of this binational training program was recently completed. In order to enhance and build on skills learned during the fall workshop, the mycobacteriologists from Mexico received intensive one-on-one bench training at the U.S. border state public health laboratories. This additive week-long training was completed in April 1998. These training initiatives have raised several technical questions concerning the different laboratory methods or procedures used in the United States and Mexico. Some of the questions will involve some strategic planning between INDRE, CDC, and the U.S./Mexico border state laboratories about the laboratory testing methods where the United States may be able to provide technical assistance.

How is all this training helping with TB surveillance along our shared borders? According to Dr. Barbara Erickson, Chief of the Arizona Bureau of State Laboratory Services, this training initiative has provided a practical working opportunity for laboratorians to share technical knowledge and skills, bridge communication barriers, and come together as a team to develop effective laboratory methods for the detection of TB, which will benefit both countries.

Infrastructure

As follow-up to the El Paso planning meeting, TATB has been actively pursuing funding and other resources to upgrade laboratory equipment in the Mexican border laboratories, including the six Mexican state laboratories. INDRE surveyed the laboratory infrastructure and equipment needs for the Mexican border laboratories as part of the El Paso meeting. TATB was awarded funding from the Health Resources and Services Administration (HRSA) to upgrade laboratory equipment in the Mexican laboratories, including the purchase of 26 microscopes. The TATB also surveyed the U.S. state laboratories to find surplus equipment that is available to transfer to the Mexican laboratories. TATB and the Texas Dept. of Health have already provided computer and laboratory equipment as loans to upgrade several of the Mexican TB control programs and laboratories.

Quality Control

The basis for TB diagnosis in Mexico and many other countries is direct sputum smear microscopy for AFB. CDC is working with the Mexican states Coahuila and Nuevo Leon, the U.S. states Texas and Massachusetts, and Vietnam to develop a proficiency testing program that low-income countries can use as quality control (QC) for AFB microscopy. This multinational project has developed a well-tested package of protocols, procedures, and software that can be used to implement a national or regional proficiency testing program to evaluate the performance of AFB microscopy at the local level. Both Vietnam and the Mexican states have pilot-tested the protocols and samples in 40 laboratories using existing networks of local clinics. Results from the initial pilot test administered to 22 local laboratories by the state laboratories in Coahuila and Nuevo Leon demonstrated some problems in identifying smears with low numbers of AFB. Preliminary results from a repeat proficiency test administered to 10 laboratories in Nuevo Leon showed a substantial improvement in performance. DLS/PHPPO is working with all the collaborators to refine the procedures, protocols, forms, software, and pilot-test data into a format for international distribution.

INDRE is also providing consultation to this proficiency testing study and has expressed interest in proficiency testing as a national QC program for AFB microscopy in Mexico. The current Mexican QC program is only partially implemented and involves a labor-intensive protocol of rescreening 100% of the positive and 10% of the negative AFB smears that are forwarded by local laboratories. (Note: All U.S. mycobacteriology laboratories are required by the Clinical Laboratory Improvement Amendments [CLIA] regulations to enroll in proficiency testing programs.)

—Reported by John Ridderhof, DrPH, Division of Laboratory Systems, PHPPO, CDC, Nerissa Majid, MPH, and Nancy Warren, PhD, ASTPHLD, and Annette Riggio, Ten Against TB, Texas Dept. of Health

STUMP THE EXPERTS

The following question was submitted by Carol Gordon, public health nurse in Farmington, ME.

Q: Many chemoprophylaxis clients and patients with TB worry about their pets. Can people catch TB from animals or give TB to them (e.g., birds, rabbits, ferrets, dogs, cats, guinea pigs)?

A: The question is whether humans can become infected from household pets with TB and vice versa. This question is quite challenging, not the least because "household pets" encompasses a vast range of creatures, and also because little epidemiologic information has been reported for most of these creatures. The scant information that has been reported is anecdotal and even vague, allowing for little in the way of conclusions or guidance. There is no formal surveillance system for studying the epidemiology of TB in pets. Overall, *M. tuberculosis* infection in pets has not had an obvious impact on human TB epidemiology or on TB program activities.

Nothing has been reported about *M. tuberculosis* infection in reptilian, amphibian, or piscine pets. Aquarium owners have gotten indolent, cutaneous, tuberculous lesions of their fingers and hands, occasionally with regional adenopathy. These lesions, known as "aquarium fancier's warts," are caused by *M. marinum*, not *M. tuberculosis*.

Rare, definitive reports have been made about TB (caused by *M. tuberculosis*) in Amazon psitticines kept as pets. The general pattern is of an inexorably progressive, disseminated infection after close contact to humans with contagious TB. Transmission from the birds to humans has not been reported. Most recently, a green winged macaw in New York City had disseminated granulomatous *M. tuberculosis* disease several years after household contact with two persons who had contagious TB. The bird's initial signs were a general wasting illness and nodular lesions of the eyelids.

Otherwise, a sizeable body of literature about "avian TB" exists, but in nearly all of the case reports, the mycobacterial species has not been determined. Instead, the presumptive cause has been reported as *M. avium-intracellulare* (MAI)—a ubiquitous avian pathogen—when it has been reported at all. No evidence of MAI transmission from any pets to humans has been described, although the source of MAI infection in HIV-infected persons remains to be determined.

In the guinea pig we have the classic example of a small mammal that is exquisitely susceptible to *M. tuberculosis* infection. Infection always leads to disease, which is uniformly fatal for them. In studies in which guinea pigs have been exposed to patients with contagious TB, investigators have estimated that even one inhaled organism could lead to disease. In experiments, these creatures have been treated successfully with preventive therapy for infection or chemotherapy for disease. Guinea pigs also are used for evaluating tuberculin skin test antigens, because their responsiveness is similar to that of humans.

House mice and Norwegian rats are two other rodents that are kept as pets, and that also are used to study TB. For the typical studies, these animals are infected by direct inoculation, but they are also susceptible to airborne organisms. Presumably, most rodent species are susceptible to TB infection. Characterized by rapidly evolving hematogenous disease, TB pathogenesis in rodents does not suggest airborne contagiousness.

Probably, most species of rabbits and hares are as susceptible to *M. tuberculosis* as guinea pigs. They also have similar manifestations of disease.

Although reports of TB transmission between pet nonhuman primates and humans are rare, some primate species that might be kept as pets are known to be more susceptible to *M. tuberculosis* infection and disease than humans are. The infection is transmissible among caged laboratory primates, and there is evidence to suggest transmission to humans.

In some of the veterinary reports about TB, "tuberculosis" does not specifically mean infection with *M. tuberculosis*. Rather, in these reports "tuberculosis" refers to the characteristic histologic lesions of the same name. Consequently, many older published cases of TB in cats and dogs cannot be attributed to a specific mycobacterium. Disease caused by several mycobacterial species, including *M. tuberculosis* and MAI, has been reported for both cats and dogs. Some case reports of *M. tuberculosis* disease in cats and dogs demonstrate that infection came from humans with contagious TB, although cats may be relatively resistant to *M. tuberculosis*. Reports describing *M. bovis* disease in barn cats exposed to infected cattle continue to be published. Recently in England, a case series of TB in cats and a related case cluster were attributed to a novel mycobacterial species having laboratory characteristics of both *M. tuberculosis* and *M. bovis*. This species seems to be virulent for cats.

Although "absence of evidence does not constitute evidence of absence," *M. tuberculosis* is unlikely to spread from diseased cats or dogs to humans. This is because pulmonary disease is a lesser manifestation in most feline and canine cases, and the affected animals usually do not live very long.

The results of tuberculin skin testing of dogs and cats are unreliable. The treatability of dogs and cats with disease caused by *Mycobacteria* species is difficult for us to assess, because most of the reported animals have been killed to make the diagnosis. In the unusual instances where chemotherapy has been described, it was unsuccessful. For the illness of an individual dog or cat, a veterinarian must be consulted.

Among the many larger animals that could be pets but which are usually not kept in the house, many ungulates (e.g., sheep) and cervids (e.g., deer and elk) are highly susceptible to *M. bovis*, which can be transmitted to humans and animals by the milk from sick animals and even by air under unusual circumstances, such as close confinement. *M. bovis* also has been spread to humans when diseased animals were necropsied with power tools because an infectious aerosol was created. *M. paratuberculosis* causes Johne's disease in some ungulates and cervids, and it affects some ovine species as well. *M. paratuberculosis* has not been proven to cause infection or disease in humans yet. Some porcine species are susceptible to MAI.

Guidelines and recommendations addressing TB in companion animals are somewhat limited. The CDC Division of Quarantine exercises regulatory authority over the importation of nonhuman primates to prevent the introduction and spread of zoonotic disease, and the USDA can prohibit or restrict the importation of certain animals and birds to

prevent the introduction of communicable livestock and poultry diseases, including bovine tuberculosis. USDA also has broad authority over TB-infected and exposed animals moving between states. A national TB working group for zoo and wildlife species was recently formed to deal with the issue of TB in zoos and other exotic animal collections. The mission of this group is to control and ultimately eradicate TB (caused by *M. tuberculosis* complex) and control other mycobacterial diseases in zoo and wildlife species. Because of the paucity of epidemiologic data about the transmisibility of *M. tuberculosis* complex between humans and pets, the investigation of suspected cases of TB caused by *M. tuberculosis* in pets ideally should include the local TB control program. In this way, we can learn more.

—Response by John Jereb, MD
Division of TB Elimination
with consultation by Stephanie Ostrowski, DVM,
Division of Quarantine,
and Tom Gomez, DVM, MS, USDA/APHIS

NEWS BRIEFS

As we have done in the past, we would like to share a few Web sites that are related to public health. We may have given you some of these before, but we think the information bears repeating.

http://www.cdc.gov
CDC home page
http://www.nih.gov/health
NIH home page
http://www.os.dhhs.gov
DHHS home page
http://www.cdc.gov/epo/mmwr/medassn.html
Other health resources on the Internet
http://www.umdnj.edu/ntbc
NJ Model TB Center
http://www.nationaltbcenter.edu/home.html
Francis J. Curry National TB Center
http://www.ci.nyc.ny.us/html/doh/html/tb/tb-hh.html
The Charles P. Felton National TB Center at Harlem Hospital
http://www.njc.org
"Welcome to National Jewish Medical and Research center"
http://www.lungusa.org/ndex.html
ALA
http://www.thoracic.org
ATS
http://www.hslib.washington.edu/clinical/ethnomed
EthnoMed home page
http://www.health.gov.au/hfs/pubs/cdi/cdilinks.htm
Contains links to international public health sites

TRAINING AND EDUCATIONAL MATERIALS

TB Training Program for Clinicians Now Available on CD-ROM

The Francis J. Curry National TB Center announces the availability of a new computer-based continuing education program for medical professionals. *Tuberculosis: An Interactive CD-ROM for Clinicians* is a CD-ROM training program on tuberculosis patient management for clinicians. Based on the CDC's *Core Curriculum on Tuberculosis (3rd edition)*, the CD-ROM features six teaching modules composed of text, video, audio and graphics:

* Screening
* Preventive Therapy
* Diagnosis
* Treatment
* TB and HIV
* Interfacing with the health department

The CD-ROM also features four interactive case studies that challenge the user to make diagnostic and treatment decisions on simulations of real patient cases. A reference section includes a glossary, index and additional text materials. Clinicians who complete the training program will be eligible to receive continuing education credits.

This project was funded by the Division of Tuberculosis Elimination, National Center for HIV, STD and TB Prevention, Centers for Disease Control and Prevention. Interested health agencies and individual providers may request an order form by contacting:

Lily Lam
Distance Learning Projects
Francis J. Curry National Tuberculosis Center
3180 18th Street, Suite 101
San Francisco, CA 94110-2028
Tel: (415) 502-7904
Fax: (415) 502-7561
lily@nationaltbcenter.edu

Technical Specifications: In order to run this CD-ROM, the user needs: IBM compatible 486 or Pentium computer with a sound card, 2X CD-ROM drive and 16 MB of RAM (8 MB available) or Macintosh Power PC with a 2X CD-ROM drive and 16 MB of RAM (8 available). The CD-ROM will play on Windows 3.1, Windows 95, and Macintosh System 7.0 or better platforms.

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The long-awaited publication,*Tuberculosis Nursing Guide*, is now available and can be ordered from the National TB Controllers Association (NTCA). Copies are $20.00, which includes shipping and handling charges. To order, call the NTCA at (888) 455-0801, or send your check or money order to

The National TB Controllers Association, Inc.
3355 NE Express Access Rd, Suite 131
Atlanta, GA 30341-4000.

NEW CDC PUBLICATIONS

Agerton TB, Valway SE, Onorato IM. The epidemiology and control of tuberculosis in the United States. *Sem Resp Crit Care Med* 1997;18:431-38.

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Grosset J, O'Brien RJ. Advances in tuberculosis preventive therapy. *Sem Resp Crit Care Med* 1997; 18:449-457.

Huebner RE. BCG vaccination in the control of tuberculosis. *Curr Top Microbiol Immunol* 1996;215:263-82.

Raviglione MC, O'Brien RJ. Tuberculosis. In *Harrison's Principles of Internal Medicine* . Isselbacher KJ, Braunwald E, Wilson JD, *et al* (Editors). Fourteenth Edition. McGraw-Hill, Inc., New York (1997), 1004-1014.

Ridzon R, Kent JH, Valway S, et al. Outbreak of drug-resistant tuberculosis with second generation transmission in a high school in California. J Pediatr 1997; 131:863-68.

Valway SE, Sanchez MP, Shinnick TF, et al. An outbreak involving extensive transmission of a virulent strain of*Mycobacterium tuberculosis*. N Engl J Med 1998;338:633-39.

Van den Broek J, Chum H, Swai R, O'Brien R. Association between leprosy and HIV infection in Tanzania. *Int J Lepr Other Mycobact Dis* 1997; 65:203-210.

PERSONNEL NOTES

Christopher Caudillwas selected for a public health advisor position in the Chicago TB program. Chris joined CDC in 1993 as a public health associate assigned by the Division of Sexually Transmitted Diseases to Chicago where he was responsible for conducting patient interviews, contact investigations, performing HIV counseling, and conducting case management. In 1995, he was transferred to Jackson, Mississippi, and was the public affairs liaison for the Ellis Avenue Clinic with responsibilities for

establishing and developing media and community contacts to promote public health issues. In addition, he was responsible for initiating a surveillance system for the clinic and developing a system to provide syphilis testing for inmates upon entering the county detention center. He will assist Chicago TB staff with the coordination of program operations. He transferred from Jackson to Chicago on January 18, 1998.

Jimmy Keller was selected for a newly established DTBE public health advisor position in the Michigan Department of Community Health. This position will be headquartered at the Detroit Department of Health. Jimmy came to work for CDC in 1991 as a public health associate in the STD program in Miami. He transferred with STD to New York City in 1992. In 1995, he was selected by DTBE for a public health advisor position in the Bureau of Tuberculosis Control in New York City. Jimmy will begin his new duties in Detroit on May 24, 1998.

Ethleen Lloyd, a public health advisor, joined the International Activity on February 1. Ethleen went through an orientation with DTBE staff during February. Ethleen received a BS degree in laboratory technology in 1971 and a BS degree in medical technology in 1972, both from Auburn University; a medical technology degree in 1972 from Duke University; an International Public Health Degree in 1981 from the Institute of Tropical Medicine, Antwerp, Belgium; and an MS degree in community health and health education in 1982 from the University of Oregon. She was certified as a Health Education Specialist in 1993. Ethleen worked as a medical technologist/laboratory supervisor at Grady Memorial Hospital from 1973 to 1977; a Peace Corps laboratory supervisor for the Lassa Fever Research Project in Sierra Leone from 1977 to 1979; a laboratory supervisor at the CDC diagnostic laboratory in Cameroon from 1979 to 1980; and a project manager of the food and nutrition program of the Catholic Relief Services in Africa from 1982 to 1987. She worked in the Division of Viral and Rickettsial Diseases, NCID, CDC, first as a scientific administrator from 1990 to 1994, and then as Chief, Education and Prevention Unit, Disease Assessment Section, from 1994 to the present. She reported to Botswana on March 9 to assist with the division's BOTUSA project.

Tony McDonald has left DTBE to take a promotion to a computer specialist position with the Information Resources Management Office (IRMO), Information Management Section. Tony was with the division over 5 years after transferring from NIOSH in Morgantown, WV. Tony provided computer and statistical support for the division and the field in the Surveillance Section of SEB. He was involved in the development of SURVS-TB from the beginning, and also assisted in the preparations for TIMS. Tony's last day with the division was February 12. He and Lynn Austin were married on February 14, Valentine's Day.

Judi Mayerhofer was selected for a public health advisor position in the California TB program. Judi came to work for CDC in February 1993 as a public health associate in the Division of TB Elimination's training program in New York City. In April 1996, she was selected for a public health advisor position in the New York State Department of Health at New Rochelle where she was primarily involved in implementing a CDC study designed to determine cost, frequency, and length of hospitalization for TB patients. She also provided technical assistance to local TB program staff and private providers. In her new position, she is responsible for assisting state officials with the implementation and management of an enhanced program to prevent and control TB in California prison facilities. She transferred from New Rochelle to Berkeley on December 7, 1997.

Dr. Ram Rao has been selected as the medical officer for Virginia. Dr. Rao attended the University of Florida in Gainesville where he received his bachelor's degree in microbiology, a PhD in biology, and an MD degree. He completed an internal medicine residency at Barnes Hospital in St. Louis and

will complete a fellowship in Pulmonary and Critical Care Medicine at Washington University School of Medicine in June. He was one of the founders 2 years ago of a university-based mycobacteriology clinic that serves patients with TB and other mycobacterial diseases in St. Louis and the surrounding area. They provide consultation on complicated patients for many health departments in the area. He also serves on the local TB Medical Advisory Board which advises the state and local TB programs. He will report to Virginia on July 6, 1998.

Bill Rodenberger has been selected for the DTBE public health advisor position assigned to the Tennessee Department of Health. Since October 1994, Bill has been on assignment to the TB program of the Hawaii Department of Health. He has served as the deputy chief of the TB Control Branch in Hawaii for the past year. He was a DTBE program consultant from 1991 to 1994 and the TB public health advisor in Alabama from 1987 to 1991 and in Indiana from 1984 to 1987. Bill will transfer from Honolulu and begin his new duties in Nashville on May 24, 1998.

Edwin Rodriguez, public health advisor assigned to the TB program of the New York State Dept. of Health, was selected for a detail to Colombia, South America. Edwin accompanied Dr. Kayla Laserson, an EIS Officer in the International Activity, on a mission to assist Colombia public health officials with the investigation of a large cluster of multidrug-resistant TB in Buenaventura. The assignment began on March 9 and ended on March 22.

Eugene Tamames was announced in the last issue of *TB Notes* as having been selected for the temporary duty assignment to Colombia described above. Subsequent to his selection, Eugene decided that it would be best for him to not be away at this time.

IN MEMORIAM

Dr. Karel Styblo, who developed the DOTS strategy that has provided the world its most effective means of controlling the current TB epidemic, died Friday, March 13, in The Hague, Netherlands, at the age of 76. Because of his work, it is now possible for developing countries to make real progress against TB - such as industrialized countries made 40 years ago - only at a much lower cost. His strategy has been rapidly adopted by over 90 countries in the last few years as a response to TB becoming the largest infectious killer of youth and adults, annually claiming the lives of nearly three million people.

Dr. Styblo contracted a severe case of TB while being held in a Nazi concentration camp in 1945. Following his release and recovery, he dedicated his life to studying the disease. For the next 30 years, Styblo watched as TB deaths dramatically decreased in post-war Europe with the availability of new TB medicines. Even so, the TB epidemic continued to spread uncontrolled in less-developed countries. Styblo applied his research to understanding how modern anti-TB medicines and control strategies could be successfully used in developing countries.

As scientific director of the International Union Against TB and Lung Disease (IUATLD) in Paris from 1979-1991, he pioneered the development of the new TB control strategy which was able to cure 8 out of 10 infectious TB patients. This strategy was tested and proven effective in Tanzania, Malawi, Mozambique, Benin, Nicaragua, and other developing countries. Initially, there was considerable resistance to Styblo's approach. Some health officials claimed there was no practical way to control TB in poor communities until socioeconomic conditions improved and more hospitals were built. Styblo disagreed, believing there was a way to provide affordable, yet supervised, TB treatment.

The first ground-breaking element in Styblo's strategy was to use a combination of anti-TB drugs called short-course chemotherapy on a large scale in a developing country. By using

the drugs isoniazid, rifampicin, pyrazinamide, and streptomycin in combination, it was possible to cut treatment time in half, thereby encouraging more TB patients to successfully complete their treatment.

The second new element was an innovative recording and reporting system. The reporting system was simple enough to be completed properly, but detailed enough to provide useful information for ongoing evaluation of the progress of each patient and of the program. Styblo believed this new reporting system would help keep health workers accountable for directly observing that TB patients take their medicines, making it unnecessary to hospitalize most TB patients during the entire treatment period.

To the surprise of many, cure rates increased from 30% and 40% to nearly 80% under Styblo's new system. Even more impressive, these results were achieved for a very small additional cost. It was calculated that the average cost for curing one patient, including transportation, infrastructure and staff costs, was under $200.

In 1990, the World Bank asked Styblo to help implement this project in China. A demonstration project was launched among 2 million people in five pilot counties of Hebei Province, near Beijing. By the end of 1991, this project was achieving phenomenal results, more than doubling cure rates and eventually achieving 94% cure rates. This provided the basis for a larger World Bank-funded project covering half of the country which has since cured over a half million TB patients.

The World Health Organization adopted Styblo's system as its recommended strategy for global TB control, and the strategy became known as DOTS, or "directly observed treatment, short-course." The World Bank now considers Styblo's system to be among the most cost-effective of all interventions in fighting sickness and disease in the Third World.

In 1966, Dr. Styblo joined the Royal Netherlands TB Association (KNCV) based in The Hague. He established the international unit of KNCV which is now involved in supporting 10 national TB programs in Africa and Asia. He remained active with KNCV until his death in advising governments on how to establish effective TB control programs, most recently traveling to South Africa to assess that country's worsening TB situation.

Dr. Styblo was cremated on Tuesday, March 17, in The Hague. The following week, groups around the world remembered the contributions of Dr. Styblo on World TB Day, March 24, as they called for wider use of his strategy.

CALENDAR OF EVENTS

June 8, 1998
TB and the Law Course
Newark, New Jersey
Debra Jean Kantor
NJ Medical School National TB Center
(973) 972-3273

June 10, 1998
Radiology Seminar
San Francisco, California
Training Coordinator
Francis J. Curry National TB Center
(415) 502-4600

June 22-26, 1998
Advanced Medical Mycobacteriology Course
Atlanta, Georgia
Public Health Practice Program Office, CDC
Application deadline is April 27, 1998
Diane Hamm, registrar: (404) 639-4859

August 4-7, 1998
TB Program Manager's Course
San Francisco, California
Training Coordinator
Francis J. Curry National TB Center
(415) 502-4600

September 2, 1998
Use of Surveillance Data to Guide and Evaluate TB Control Programs
San Francisco, California
Training Coordinator
Francis J. Curry National TB Center
(415) 502-4600

October 19-23, 1998; February 15-19, 1999; April 19-23, 1999
Postgraduate Course on Clinical Management and Control of Tuberculosis
Denver, Colorado
National Jewish Medical and Research Center
Catheryne J. Queen
Tel: (303) 398-1700
Fax: (303) 398-1906

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

LABORATORY RISK ASSESSMENT WHAT, WHY, AND HOW

Risk Assessment in the Infectious Disease Laboratory

~A Public Health Training Network Satellite Broadcast~

July 23, 1998 2:00 PM - 4:00 PM ET

Protecting people from laboratory hazards is an ongoing concern. Laboratory workers as well as people in the community must not be placed at undue risk of exposure to dangerous substances or conditions. To protect laboratory workers, hazards associated with their jobs must first be identified by performing a risk assessment. Once the hazards have been identified, effective interventions can be implemented. This interactive training program provides the learner with the tools for performing risk assessments--the what, the why, and the how--in the infectious disease laboratory. During the program, participants will have the opportunity to perform a risk assessment in a simulated mycobacteriology laboratory under the guidance of experts.

Objectives

After the satellite broadcast, participants will be able to--

- Describe the principles and list the reasons for doing risk assessments of laboratories working with infectious agents.
- Perform a risk assessment of a simulated mycobacteriology laboratory looking at the laboratory's personnel, activities, and facility.
- State important resources for obtaining information about performing and applying risk assessments in the laboratory.

Target Audience

Infectious disease personnel from public health, hospital, physician office, and research laboratories--laboratory directors, supervisors, technologists, technicians, and researchers; laboratory safety officers, trainers, designers and engineers, and administrators.

Faculty

Jonathan Richmond, PhD, Director, Office of Health and Safety, CDC
Nancy G. Warren, PhD, Scientific Advisor, Association of State and Territorial Public Health Laboratory Directors (ASTPHLD)
Others: To be announced

Registration

Participants may register for this program by calling 1-800 41-TRAIN. There is no charge to view this program. **Participants requesting continuing education credit must register before May 29, 1998.**

Continuing Education Credit

Continuing education credit will be offered for a variety of professions, based on 2 hours of instruction.

How to View the Program

Locate a satellite downlink site with a steerable antenna which can receive either Ku- or C-band channels. **Schools, hospitals, community colleges, universities, and county extension offices often have the required equipment.** A telephone and fax near the viewing room will allow for interaction with the presenters. All VA hospitals will receive this program.

Satellite Technical Specifications

This satellite videoconference is expected to be available on C and Ku-band. Specific coordinates will be available approximately 30 days prior to the program; at that time call (888) 232-3299, and enter document #130010 when prompted.

Sponsors

This program is sponsored by CDC's National Center for HIV, STD, and TB Prevention and developed by the Office of Health and Safety and the Public Health Practice Program Office